distinctly a little redder than the N. equatorial belt. The next epoch of maximum and minimum will occur in 1903, and I venture to predict that in that year the N. equatorial belt will be intensely red, whilst the S. equatorial belt will then appear colourless, or even of a bluish tint.

Photographs of the Radiant of the Leonid Meteors, and Attempts to Photograph the Meteor Stream. By Isaac Roberts, D.Sc., F.R.S.

The part of the sky around the radiant point of the Leonid meteors was closely watched during the night of the 13th and morning of the 14th November last, and during an interval of absence of clouds four photographs were obtained, two with the 20-inch reflector, and two with the 5-inch lens camera.

Clouds overcast the sky until two o'clock on the morning of the 14th, and then clearness set in, which continued till day-break. During that interval the four photographs were taken—two with simultaneous exposures of two hours, and two with ninety minutes'.

Only two Leonid meteors fell during the three and a half hours' interval, and they did not become luminous within the range of the camera photo-field of $7\frac{1}{2}$ degrees radius from the radiant, and consequently they were not photographed, but their directions with reference to certain stars were determined by sight. No other interval was suitable for photographic work during the passing of the stream.

On examination of the plates two nebulæ were discovered in close proximity to the radiant; and the following are their co-ordinates as deduced from the star *D.M.* No. 2164, zone 22° north, R.A. $9^h\ 54^m\ 44^s{\cdot}4$, Dec. north 22° 39′·7, Epoch 1855. The nebulæ are in the positions R.A. $9^h\ 55^m\ 54^s{\cdot}8$, Dec. north 22° 59′·4, and R.A. $9^h\ 55^m\ 54^s{\cdot}8$, Dec. north 22° 58′·7.

The northernmost nebula is a well-defined star of about 13th magnitude, surrounded by a halo of faint nebulosity; and the other nebula, which is 42 seconds of arc south of it, resembles a star of about 16th magnitude, elongated nearly in *preceding* to *following* direction. These nebulæ are not referred to in the catalogues. I thought it possible that they were connected with the meteor stream, but another photograph taken on December 9 (25 days later) showed no change in their position, and therefore they could not be connected with the meteors.

Attempts to Photograph the Meteor Stream.

The Ephemeris of the denser part of the meteor stream which was prepared, under the directions of Dr. G. Johnstone Stoney and Dr. Downing, by Mr. Wright and other computers at the

office of the *Nautical Almanac*, and published in the *Monthly Notices* of this Society for 1898 November, enabled me to make fair trials in photographing the stream by aid of the 20-inch reflector and the 5-inch lens camera; and it was reasonable to expect that after the great care which had been taken in the preparation of the Ephemeris some practical results would be obtained.

Watchful vigilance was kept at my observatory for clear intervals in the sky between January 1 and March 10 (last month); but the sky had been abnormally covered with clouds and mistiness during the whole of the autumn and winter months. The moonlight also interfered with this kind of photographic work, and it was not till February 16 that the first suitable opportunity occurred to make a photographic trial with an exposure of ninety minutes. The plate when developed showed no indication of the meteors. The second opportunity occurred on March 5, when an exposure of two hours was made, but still there was no indication of the meteors. The third, and last, trial was made on March 10, when an exposure of four hours was obtained; but still there was no indication of the meteors; and if light of the feebleness of 17th to 18th magnitude stars had accompanied them, each of the photographs referred to would have shown it, for the conditions were favourable to photograph light up to that limit.

We all regret the absence of success in these experiments; but they were well worth the trouble and expense incurred in making the several trials during the past three years, and I do not regret having made the attempts.

The next important work that claims our attention in connection with this question is that of photographing the trails of the meteors as they pass through the Earth's atmosphere in November next; and although moonlight will to a considerable extent interfere, I think it probable that many trails will be bright enough to show through the effects of moonlight on the photographic plates. On this assumption I would offer the following suggestions:—

(1) We should take trial photographs, at favourable opportunities, between now and November, with the instruments and photo-plates we then propose to use.

(2) The photo-plates should be exposed separately in the camera, or telescope, during respective intervals of 5, 10, 15, 20, and 30 minutes, upon any part of the sky, with declination 23 degrees north. These experimental exposures should be made at those times which occur each month when the Moon will be about 135 degrees from the part of the sky here indicated, and when it is eleven days old. These conditions will roughly correspond with the lunar conditions that will prevail on November 14 next.

(3) The experimental plates should be developed till the films show a decided darkening by the effect of the moonlit sky,

and thus we shall be able to determine the equation of the instruments and gain experience for our guidance before the critical time for action arrives. We shall be able to judge beforehand for what length of time we may safely continue the exposures of the plates in the camera during partial moonlight, without risk of spoiling them by over-exposure, and also save trouble and time in changing the plates at unnecessarily short intervals.

Observations of Planet (433) *Eros, and of Comet Tuttle, at the Radcliffe Observatory, Oxford.*

(*Communicated by the Radcliffe Observer.*)

The following observations were made with the 10-inch Barclay Equatorial, using the ring micrometer, with power 100.

Date.	G.M.T.	Local Sidereal Time.	Observer.	Planet or Comet *minus* Star (corrected for Refraction only). R.A.	N.P.D.	No. of Comps.	Apparent R.A. of Planet or Comet.	Parallax in R.A. p.	Log. $(p \times \Delta)$.	Apparent N.P.D. of Planet or Comet.	Parallax in N.P.D. q.	Log $(q \times \Delta)$.	Ref.
				Planet Eros.									
1898.	h m s	h m s		s	′ ″		h m s	s		° ′ ″	″		
Sept. 6	11 1 35	22 0 45	R.	−10·74	+0 11·28	11	20 49 7·18	+0·14	9·0526	96 19 20·1	9·32	0·8713	(*a*)
				Comet Tuttle.									
1899.													
Apr. 10	9 2 48	10 13 14	R.	−51·59	−5 49·25	6	3 32 17·61	+0·22	9·5843	69 18 55·5	3·91	0·8327	(*b*)

Observer's Remarks.

(*a*) Planet faint; estimated magnitude 11·5. Sky hazy.
(*b*) Comet excessively faint; altitude small. Observations very difficult.

Assumed Places of the Comparison Stars.

Ref.	Mean R.A.	Reduction to Appar. R.A.	Mean N.P.D.	Reduction to Appar. N.P.D.	Authority.
	h m s	s	° ′ ″	″	
(*a*)	20 49 13·56	+4·36	96 19 27·25	−18·43	Radcliffe Transit Circle observations, 1898 Sept. 10, 14.
(*b*)	3 33 8·28	+0·92	69 24 49·08	−4·33	Mean of Berlin B (A.G.) 1084, and Greenwich (1880) 557.

In the computation of the parallaxes the adopted value of the Sun's mean horizontal parallax is 8″·85; and the geocentric distances, Δ, are taken from the *Astronomische Nachrichten*, Nos. 3517 and 3555.

Observer: R., Mr. W. H. Robinson.

Radcliffe Observatory, Oxford:
1899 *April* 13.